

Customer No.: 31561
Docket No.: 13528-US-PA
Application No.: 10/711,543

REMARKS

Present Status of the Application

The Office Action rejected claim 4 under 35 U.S.C. 103(a) as being unpatentable over Deane et al. (US Pub. No. 2006/0097965) taken with Sakashita et al. (US Pub. No. 2004/0169665) in view of Iwasaki (US Pub. No. 2004/0179315).

The Office Action rejected claim 6 under 35 U.S.C. 103(a) as being unpatentable over Deane et al. taken with Sakashita et al. in view of Iwasaki as applied to claim 4, and further in view of Nakajima et al. (US Pub. No. 2004/0183772).

The Office Action objected claim 5 as being dependent on a rejected base claim.

The Office Action allowed claims 1-3 and 7-14.

Discussion of Office Action Rejections under 35 U.S.C. 103(a)

The Office Action rejected claim 4 under 35 U.S.C. 103(a) as being unpatentable over Deane et al. (US Pub. No. 2006/0097965) taken with Sakashita et al. (US Pub. No. 2004/0169665) in view of Iwasaki (US Pub. No. 2004/0179315). The Office Action rejected claim 6 under 35 U.S.C. 103(a) as being unpatentable over Deane et al. taken with Sakashita et al. in view of Iwasaki as applied to claim 4, and further in view of Nakajima et al. (US Pub. No. 2004/0183772).

The present invention is directed to an electronic discharging control circuit and method thereof for a liquid crystal display (LCD). In the LCD according to the present invention, when an LCD power-off signal is detected, a first control signal is provided to disable a power supply module and turn off a pixel transistor turn-on potential level after

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a first delay time, and a second control signal is provided to turn on all the pixel transistors after a second delay time. The charges on the pixel transistor can be discharged via a source thereof, such that a residual image phenomenon caused by heterogeneous filming fabrication is reduced.

Independent Claim 4 recites the features as follows:

4. A method of discharging pixel transistors of an LCD device, comprising:
detecting whether the LCD device stops displaying an image;
providing a first signal to disable a power module of the LCD device and turn off a pixel transistor turn-on potential level after a first delay time; and
providing a second signal to turn on all the pixel transistors after a second delay time.

In Office Action, examiner states that:

(1) Deane discloses a method of discharging pixel transistors of an LCD device (pg.3 para. 0028);

(2) Sakashita discloses a method of displaying an image. Sakashita et al. further discloses detecting whether an LCD device stops displaying an image; providing a first signal to disable a power module of the LCD device and turn off a pixel transistor turn-on potential level after a first delay time(pg. 4, para. 0076);

(3) Iwasaki discloses an LCD power source control method and control circuit thereof. Iwasaki further discloses providing a second signal to turn on all the pixel

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transistors after a second delay time (pg. 8, para.108 and pg.11, para. 0153).

However, in Sakashita, when it is determined that there is no image signal (step S21 in Fig. 6, pg. 4, para. 0076), the process returns to perform a sub screen displaying process for an image input via the next input terminal (steps S1-S4 in Fig.6). Sakashita only discloses disabling writing into a frame memory after a predetermined length of time in the sub screen displaying process (steps S1-S2). Sakashita fails to teach or suggest providing a first signal to disable a power module of the LCD device and turn off a pixel transistor turn-on potential level after a first delay time. Sakashita also fails to teach or suggest providing a second signal to turn on all the pixel transistors after a second delay time.

In Iwasaki, when a logic voltage detecting circuit 47 has detected a voltage drop of a logic circuit power source, the logic voltage detecting circuit 47 generates a signal indicating the voltage drop. An LCD drive power source supply/interruption circuit 50 is caused to be in an interruption state to interrupt a voltage from an LCD drive power source to an LCD drive circuit of an LCD device. An LCD electric charge compulsory discharging circuit 52 is caused to be in an operation state to forcibly discharge the residual charges of the LCD drive circuit (pg. 2 para. 0025, pg. 11 paras.0153-0159 and Figs. 8A, 8B). It should be noted that the LCD electric charge compulsory discharging circuit 52 is a separate device from the LCD device. That is, the signal generated by the logic voltage detecting circuit 47 is used to turn on the transistors serving as switching elements in the LCD electric charge compulsory discharging circuit 52, rather than the all

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the pixel transistors of the LCD device. Iwasaki fails to teach or suggest providing a second signal to turn on all the pixel transistors after a second delay time. Iwasaki also fails to teach or suggest providing a first signal to disable a power module of the LCD device and turn off a pixel transistor turn-on potential level after a first delay time.

Therefore, Deane, Sakashita and Iwasaki all fail to teach or suggest providing a first signal to disable a power module of the LCD device and turn off a pixel transistor turn-on potential level after a first delay time; and fail to teach or suggest providing a second signal to turn on all the pixel transistors after a second delay time. A person of ordinary skill in the art can not combine Deane, Sakashita and Iwasaki to achieve all of the features as set forth in claim 4. So claim 4 is patentable over Deane taken with Sakashita in view of Iwasaki, and thus should be allowed.

Furthermore, Nakajima also fails to teach or suggest providing a first signal to disable a power module of the LCD device and turn off a pixel transistor turn-on potential level after a first delay time; and fails to teach or suggest providing a second signal to turn on all the pixel transistors after a second delay time. A person of ordinary skill in the art can not combine Deane, Sakashita, Iwasaki and Nakajima to achieve all of the features as set forth in claim 4. So claim 4 is patentable over Deane taken with Sakashita in view of Iwasaki and further in view of Nakajima, and thus should be allowed.

Dependent claim 6 should also be patentable since it depends on allowable claim 4 directly.

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Discussion of Office Action Objection addressed to claim 5

As the reasons similar to independent claim 4, Dependent claim 5 should also be allowed since it depends on allowable claim 4.

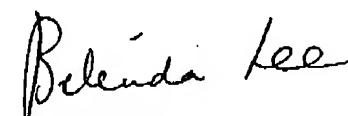
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CONCLUSION

For at least the foregoing reasons, it is believed that the claims 4-6 are in proper condition for allowance. If the Examiner believes that a telephone conference would expedite the examination of the above-identified patent application, the Examiner is invited to call the undersigned.

Respectfully submitted,

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